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ABSTRACT

This analysis outlines the generally inconclusive nature of class size research. In the area of achievement as it relates to class size, the research is demonstrated to be especially inconclusive. In addition to analyzing the problems and weaknesses of class size research, this paper summarizes the effects of class size on the educational process and on student and teacher attitudes, as well as the economic effects of reducing class size. A 60-item bibliography is included. (Author/WM)

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Class Size

school leadership digest

Dee Schofield

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FOREWORD

With the *School Leadership Digest* series, the National Association of Elementary School Principals adds another project to its continuing program of publications designed to offer school leaders essential information on a wide range of critical concerns in education.

The *School Leadership Digest* is a series of monthly reports on top priority issues in education. At a time when decisions in education must be made on the basis of increasingly complex information, the *Digest* provides school administrators with concise, readable analyses of the most important trends in schools today, as well as points up the practical implications of major research findings.

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The author of this report, Dee Schofield, is employed by the Clearinghouse as a research analyst and writer.

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INTRODUCTION

Class size has been an issue in educational circles for literally decades. And the task of discovering optimum class size has been the concern of educators, as well as the topic of educational research, since the turn of the century. But in spite of the great amount of investigation conducted in this area, the issues remain largely unresolved.

To date, the research is inconclusive even as to whether small classes or large classes are more desirable. The one major point of general agreement seems to be that an ideal class size cannot be exactly determined, except perhaps for each specific, unique situation. Generalizations dealing with the effects of class size on students, teachers, and the educational process as a whole do not seem to be readily ascertainable.

One reason for the lack of substantive conclusions in these areas has been the inadequacies of some of the research. Some investigators have failed to control for certain variables that inevitably influence results, and they have also used such a variety of definitions of, and measures for, class size, that it is difficult to draw general conclusions from their findings.

But in spite of these difficulties, the questions relating to class size remain important to administrators, teachers, and parents who desire to utilize the American educational system to its fullest and who are inevitably faced with the recurring issue of reconciling educational quality with existing economic resources.

This paper reviews and evaluates the research dealing with class size and its effects on pupil achievement and the educational process, as well as its effects on the economic aspects of school operation. Also discussed are the attitudes of students, teachers, and administrators toward class size.

THE RESEARCH: ITS PROBLEMS AND WEAKNESSES

> In reviewing the research on class size it becomes increasingly clear that one of the major problems in the interpretation and application of the data is the kind of variable used to measure class size.
>
> *Lindbloom*

As Lindbloom indicates, problems of definition have always plagued the research conducted on class size, contributing to the difficulty of formulating valid conclusions from the research as a whole. The confusion lies in *what* is being measured, as well as in the terms in which the results are presented. Some studies base their findings solely on class size, while others measure student/teacher ratio, class load, or staffing ratio.

Closely related to these concepts is the definition of *teacher*. Some researchers define "teacher" as the person responsible for a certain number of pupils in "a self-centered classroom" (see, for example, the National Education Association survey cited by Lindbloom). Other researchers have expanded the definition of "teacher" to include supporting staff—paraprofessionals, specialists, counselors, and administrators, or in Shapson's terms, "all personnel resources contributing to achievement."

To clarify these various concepts, the New York State Teachers' Association formulated in 1959 the following definitions:

> *Class size* is the number of students assigned to a teacher for a period of instruction. In elementary schools, where one teacher directs all learning, it is the number of pupils for whom a teacher is responsible daily. In secondary schools or other schools in which teachers are responsible for instruction in a particular subject, it is the number of pupils for whom a teacher is responsible during a single period.
>
> *Class load* is the number of pupils for whom teachers are

responsible daily where the teacher is assigned more than one class each day.

Staffing ratio represents the ratio of professional staff (supervisors, administrators, teachers, and professional personnel) to pupils. It should be understood that a school system may have a large class size and yet have a relatively low ratio of pupils to staff positions.

Although fourteen years old, these definitions retain their validity, even in view of recent teaching innovations such as teaming. In a team teaching situation, for example, class size can be figured on the basis of staffing ratio or class load.

Closely related to staffing ratio is Numerical Staff Adequacy (NSA)—a measure initially developed by McKenna. NSA figures the overall staff/pupil ratio; Lindbloom defines it as "the number of professionals of all kinds employed per 1,000 pupils."

Although class size, class load, and staffing adequacy may be defined as separate concepts, researchers often confuse the three. As Shapson notes, "The use of class size and staffing ratio interchangeably is one main source of confusion. In some studies the variable measured has been all personnel resources contributing to achievement; in other studies the measure was based only on the classroom teacher."

Another aspect of confusion over definition of class size concerns how "large" and "small" classes are defined. What is large (numerically speaking) to one researcher may be small to another, and vice versa. Templeton paraphrases Sitkei's 1968 observation that "there is a great deal of variation among school systems and researchers as to what they mean when they speak of a 'small' class or a 'large' class." Therefore, before research can be evaluated, or decisions based on it, the reader should be aware not only of *what* is being measured (class size, class load, staffing ratio), but of how class size distinctions are numerically defined. For example, if a researcher concludes that "small" classes are more desirable, based on his findings, the reader must know how he defines "small" (five pupils? or 35 pupils?).

Another problem plaguing the research on class size is

closely related to the lack of consistency in definition: Researchers have generally failed to agree on what the effects of class size are, and on how they are to be measured. Even if a study carefully defines class size, the measures it utilizes may not take into account all the variables actually affecting the results. And such a variety of measures are used in different studies that general conclusions are difficult to draw. As Lindbloom notes, "In examining statistics or the results of research studies on class size, then, one must be extremely careful in drawing conclusions, generalizing, or making comparisons, since measures themselves vary widely and the content of the measures is often not precisely controlled."

Shapson outlines two areas in which inconsistency of measurement and definition contribute to the confusion arising from class size research. The first, pupil achievement, is measured differently by different researchers. The second, method of instruction, is often neglected completely, or the researchers fail to control this variable, making their results questionable.

Pupil achievement is directly related to "criteria of success," according to Shapson. In many studies, these criteria are measured only by standardized test, a practice that tends to inaccurately minimize other equally important aspects of achievement, as Shapson points out:

> An essential question which must be answered is the following: What criteria of success should be used? Achievement as measured by a standardized test is only one product of the educational environment on which the effects of class size can be assessed. An achievement test generally measures a highly specialized type of learning and as such represents only one part of what the school is trying to achieve. . . . educators generally agree that factual learning is not the only goal of education.

Other aspects of achievement that are all too infrequently taken into account by researchers include the development of the pupil's creative and social skills, as well as his assimilation of factual material—the aspect of achievement measured by standardized tests. Sitkei also notes that these other areas of achievement are as equally important as factual learning.

The effects of methods of instruction on pupil achievement, regardless of how that achievement is defined and measured, are, according to Shapson, often neglected in class size research. He calls method of instruction "one of the many variables which should be taken into account in research on class size." He points out that frequently the research either fails to define the methods of instruction used, or fails to control the factors influencing those methods. Shapson thus concurs with the 1969 *Encyclopedia of Educational Research*, edited by Robert L. Ebel, which emphasizes the importance of instructional method in class size research:

> Any criterion employed to assess the effect of class size is in actuality assessing the accomplishments of some method—the method of teaching which was used in the study in question. Whether it appears to better advantage in large classes or in small classes depends upon the compatibility of the method with the size of the groups being investigated. One is at a loss to know, with respect to virtually all the class-size literature, whether the research design specifies a method for either or both of the class-size categories and whether the method specified was actually consistently employed.

The factors mentioned above (lack of consistent definitions, inconsistent measures, and uncontrolled variables) all contribute to the general weakness in class size research—its inconclusive nature. Anderson and Walberg point out that this weakness prevents the research from being of any real assistance to decision-makers. And even though educational research as a whole shares the same weakness to some degree, other areas are not plagued with inconclusiveness to the extent that class size research is. As Anderson and Walberg state,

> For, if educational research is to make any serious contribution to educational practice, the kind of findings uncovered must be sufficiently broad and general as to be applicable in a real educational setting. In other words, the findings from one group of studies using one particular sample, if worthwhile, should be relevant for somewhat different situations and somewhat different student groups. . . . if replication and generality cannot be established or is unpromising, then it will not be possible to apply findings from one setting to any other.

And because of the weaknesses listed above, class size research on the whole does not allow for the kind of general applicability called for by Anderson and Walberg.

To outline the weaknesses in research on class size is not to say that that research is without value or interest to the educator and administrator. On the contrary, those individuals concerned with the effective and efficient operation of America's schools should be apprised of the available data on class size, even while bearing in mind that such data may not offer the major basis for decision-making. The research can provide the educator with valuable insights into some of the effects of class size on the educational process and pupil achievement, as well as insight into the better-documented economic effects of reducing or increasing class size.

CLASS SIZE AND THE EDUCATIONAL PROCESS

Educational process is, of course, a somewhat difficult thing to define. The researchers dealing with class size have measured a variety of factors that contribute to overall classroom interaction between teacher and pupils--interaction that leads to education.

The format of many of these studies is observation of actual classroom situations. Observers have measured such elements as, in Lindbloom's words, "instructional methods, curriculum design, instructional equipment, individual differences, and physical environment," in addition to pupil/teacher contact and student social interaction within the classroom.

Some researchers have also observed and attempted to measure differences in motivation and in attitude change, both for pupils and for teachers. For the most part, as Templeton observes, these studies have not been primarily concerned with measuring achievement according to standardized tests. Instead, they have been concerned with how education is achieved and implicitly with the goals of the educational system itself.

In an early study (1954), Otto utilized an observational approach with investigating teams to visit 50 small (25 or fewer) classes and 50 large (35 or more) classes. The investigators examined 500 items in each classroom to evaluate the educational programs. While finding little difference between the small and large classes, Otto did conclude that "the total educational environment and program for children appear to be somewhat better in small classes than in large classes."

From this and other early attempts to define and measure the educational process, Pugh developed his "Guide for Observation," identifying 16 learning activities. The guide enabled his observers to note methods of instruction and individual attention to pupils, as well as the means by which pupils learn (including listening, reading, recalling, observing, exe-

cuting manipulative skills, outlining, generalizing, and creating).

His findings, based on 180 classroom visitations, generally indicated that pupils in small classrooms (under 20) received more individual attention and instruction, though teachers of both large (over 30) and small classes utilized mass instruction. However, the percentage of mass instruction techniques was much higher for large classes than for small, and the opportunities for individual instruction were much greater in small classes.

Pugh also discovered a statistically significant difference in the kind of learning activities used in small and large classes. In small classes, executing motor skills, outlining, generalizing, practicing reading skills, and creating were more evident than in large classes. A greater percentage of small-group activities was carried out in small classes. And finally, teachers of primary pupils exhibited the greatest amount of concern for their students as individuals, regardless of the size of their classes.

Pugh's 1965 findings concurred with those of the National Education Association, obtained two years earlier. According to the NEA study, "large classes of 35-40 students made it impossible for a teacher to cope with individual differences within a self-contained classroom setting."

Cannon's study of kindergarten children also concluded that smaller classes offer a better learning environment. Using the same teacher in the same room with the same equipment, she studied one large (34-39 children) and one small (23-28 children) class, attempting to keep the variables as constant as possible. Cannon concluded, according to Lindbloom, that "the small class situation provided improved relationships and learning climate as well as a higher quality of living and learning." Specifically, more teacher attention was directed to the individual pupil in the small class, the teacher was allowed more creativity in teaching in the small class, and aggressiveness among pupils was minimized in the small class because of less crowded conditions.

Other researchers have found that small class size does not

necessarily lead to an improved learning environment. Teachers do not automatically take advantage of the opportunities for individualized instruction and attention that small classes afford. Danowski found that only about half of the small-class (20 or less) teachers took advantage of individualized instruction methods. In 1968, Haberman and Larson discovered little difference in teaching mode between teachers of large and small classes. They state that "single activity, with the teacher speaking or monitoring silence, was the dominant theme of both large and small classes."

In a 1964 study, McKenna and Pugh recommended that teachers be specially trained to take advantage of the opportunities for different kinds of instruction offered by the small-class environment. If teachers are given time to plan for small classes, then it is more likely that they will employ innovative, individual teaching methods. As Mitchell points out, "small classes in themselves do not guarantee more individualized programs," but they do provide an environment conducive to the development of such practices.

Shapson concludes that although "not all teachers automatically take advantage of the opportunity for individualization of instruction that small classes afford," the uniqueness of each teaching situation must be taken into account. He states, "It is unlikely that the same teaching method is best for all situations. If the same teaching techniques are used in both groups, it is likely that no difference [in educational process] would be found in large and small classes."

CLASS SIZE AND PUPIL ACHIEVEMENT

Most researchers concerned with measuring educational processes use some kind of observation. In contrast, the researchers investigating pupil academic achievement generally use some variety of standardized test as a measure. And these latter studies are, according to Lindbloom, less conclusive than those attempting to measure educational processes. He states that "while the bulk of the studies which have examined educational processes present in classes of varying size seem to favor small class size over large class size, studies examining the effects of class size on pupil achievement reveal inconclusive results."

One of the most comprehensive studies of the effects of class size on pupil achievement was conducted by Woodson in 1968. In a survey of the class-size policy of 95 school systems, he concluded that within a given district, a measurable relationship between achievement and size remains the same in different subject areas and for pupils of different academic potential. The achievement-size relationship is also the same from grade to grade.

Woodson also divided the districts he studied according to class size. As Lindbloom states, "He further found, when separating districts by class size into upper and lower thirds, that standard scores of the achievement residuals were higher for those districts in the lower third of class size range."

Another comprehensive study of class size and achievement was conducted over a five-year period by Furno and Collins. Measuring achievement in reading and arithmetic, these researchers investigated data from the Baltimore public schools on third grade pupils. They found that pupils in the smallest classes (1-25) scored higher on standardized achievement tests than pupils in larger classes. One of the major values of this study is that it was conducted over a sufficiently long period to note trends and patterns in achievement.

Balow found that a reduction in class size from an average of 30 pupils to an average of 15 pupils led to achievement gains in reading for first- through fourth-grade students. He concluded, however, that class size has a more important effect on reading achievement for pupils in the first two grades than for those in the upper grades. "By the middle of the third grade achievement patterns are pretty well stabilized and smaller class size, by itself, does not have sufficient impact to change these patterns." Class size was the only variable changed in this study. No special methods of instruction or special equipment were utilized in either the small or the large classes. Thus, Balow concluded that the greater achievement evidenced by pupils in small classes was a result of class size alone.

Other researchers have found that class size has little or no effect on pupil achievement. Using the Iowa Basic Skills tests, Johnson and Scriven tested seventh- and eighth-grade pupils for English and mathematics skills. They found that even when extremely small (fewer than 25) classes were compared with extremely large (more than 33) classes, no significant gains in academic achievement were evident for either group. They concluded that class size has no significant effect on pupil achievement for this group of pupils.

After its review of the literature, the President's Commission on School Finance in 1972 found "no research evidence that demonstrates improved student achievement resulting from decreasing pupil-teacher ratios."

The conclusion that large classes lead to increased pupil achievement has been drawn in some of the research. In 1968, Madden measured achievement of ninth-grade pupils in mathematics and found that, when the high and low achievers were eliminated from the sample, the pupils in the large classes scored higher than those in small classes.

One of the most recent studies of the effect of class size on achievement was conducted by Flinker in 1972. He compared language arts and mathematics skills of a large class of 55 seventh-grade pupils with those of two smaller classes of 34 seventh-grade pupils each. His results indicated that the

pupils in the large class made more gains in achievement than did the pupils in the small classes. He concluded that "the testing results indicate that the large class organization in the seventh grade favors the development of skills and concepts in language arts and mathematics." However, it is most important to note two factors that contributed to Flinker's results. First, the large class was taught by the department chairman in each area. And second, a teacher assistant helped to conduct the large class. Flinker acknowledges that the presence of the assistant may have affected his results.

> Although the period of instruction was the same for all classes, the teacher of the large class had more time for actual teaching because of the help of the educational assistant. It is likely, also, that because of the availability of the paraprofessional worker the large class had better decorum, more quizzes, tests, and written exercises than the regular classes.

Shapson criticizes Flinker's study because he failed to control for all of the variables affecting his results. As Shapson states, "Are the results obtained in Flinker's study attributable to the effects of class size, or quality of instruction or teacher load? Because of the inadequacy of the experimental design, this question cannot be answered."

Shapson also criticizes a study conducted by Little, Mabey, and Russell on the grounds that not all of the variables affecting the results were taken into account. Even though these British researchers concluded that pupils in larger classes scored slightly higher on reading tests than those in smaller classes, they failed to account for school policies that placed slower learners in smaller classes, and for policies placing inexperienced teachers in small classes. These factors would have obviously affected their results, as Shapson notes.

Coleman raises the issue that class size, along with other factors supposedly contributing to the education process, may have very little, if any, influence on pupil achievement. In summarizing a study he completed in 1966, Coleman comments in 1971 on the conclusions of his earlier research: "the school factors had little relation to pupil achievement, . . . [and] differences in student achievement 'appeared to arise

not principally from factors that the school system controlled, but from factors outside the school'." If these findings are valid, then the question of the effects of class size on pupil achievement may be somewhat of a moot point. However, Coleman's is the only research indicating that the question may be irrelevant.

The research on academic achievement and class size is indeed inconclusive, as Lindbloom states. It is true that some of the most thorough and carefully conducted research—for example, the studies by Woodson and by Furno and Collins—would seem to indicate that smaller classes may lead to improvement of achievement. But these studies and others need the kind of replication of results called for by Anderson and Walberg, which so far has not been achieved.

NONACADEMIC EFFECTS OF CLASS SIZE

That class size has a definite effect on the attitudes of students and teachers is well established by the research. Not a lot of investigation has been conducted in this area, however, especially on student attitudes. The role class size plays in the social adjustment of students is another area that has not received much attention by researchers. But these less easily measureable aspects of educational experience are as important as academic achievement as long as the school continues to play a major part in the socialization of American children.

Student Attitudes and Social Adjustment

Shapson notes that although some attention has been given to teacher attitudes toward class size, very little has been directed to either elementary or secondary student attitudes. Shapson cites only one study, by Eash and Bennett in 1964, in which students were interviewed to ascertain their opinions of large lecture classes versus small lecture-discussion classes. The students in the large classes viewed the teacher "primarily as a dispenser of information," whereas those in smaller classes viewed the teacher "in many different roles." Shapson concludes that, as reflected in this study, the class size "influenced students' perceptions of the instructor and his technique."

Mitchell also notes that very little research has been conducted concerning student attitudes and "pupil morale." He states, "One area of concern which has been largely neglected has been the problem of pupil morale."

Student attitude toward class size could be an important indicator of the effect of class size on social adjustment. In 1961, Shane concluded that small classes were essential to the development of the individual student's full potential and to the development of what Mitchell calls "human values."

The area of student relationships was explored by Hubbard

in 1963. He found that relationships among students increased with larger classes and that those relationships were quite varied in large classes. Both of these factors lead to a corresponding increase in behavior problems.

Hubbard's findings agree with Cannon's study of kindergarten children. Cannon noted higher levels of aggression and frustration among children in large classes. The more crowded conditions in the large classes resulted in more aggressive acts, such as pushing and striking—acts teachers consider to be behavior problems.

In 1972 Anderson and Walberg replicated a 1969 study by Walberg that had investigated the social effects of class size. They found that small classes lead to more cohesiveness among students, but also that students perceive small classes as more difficult. In other words, while the small class is viewed as being more of a unified group, it is also seen as more demanding. The authors note that small classes may be seen as more difficult because "the small class provides much less opportunity for students to 'drop out.' In a sense, students in the small class are under constant scrutiny by the teacher and are also influenced by the work of their peers which is more visible in a small class than in a large one."

Teacher Attitudes and Morale

Although little is known about students' attitudes toward class size, teachers' attitudes are fairly well documented. Generally, teachers favor small classes over large classes and believe that in small classes they are better able to realize their teaching potential.

A 1959 study by the New York State Teachers Association found, according to Shapson, "a positive relationship" between "class size and the amount of nervous strain reported by teachers." Elementary teachers experienced little nervous strain when they had 26 or less pupils in their classes; those with more than 29 experienced the most nervous strain.

Hubbard reports that teachers consider 30 pupils to be the "breaking point." And Mitchell states that when teachers

had more than 30 pupils in a class, they claimed that the "sheer numbers made them depressed and frustrated."

An opinion poll conducted in 1963 by the NEA Research Division revealed that about two-thirds of the respondents (teachers and principals) believe that no more than 24 pupils should be in one class."

In a more recent poll reported in the October 11, 1972, issue of *Report on Education Research*, "Teachers Speak Out on Their Problems," teachers listed pupil/teacher ratio as one of the most "serious" or "critical" situations confronting them. They also listed nonteaching chores as another critical situation—a situation in part determined by class size. The teacher of a large class must spend more time performing such duties than the teacher of a small class does.

Hymes discovered in his interviews of kindergarten teachers a similar negative attitude toward large classes. He notes that instead of a surplus of kindergarten teachers, there is a notable scarcity, resulting in overcrowding and increased teacher frustration. He summarizes teachers' attitudes toward large classes as follows:

> . . . among the teachers I see who are feeling low, the Number One Villain is large class size. These teachers have been told that research doesn't prove that class size makes any difference. They think, however, that their own day-by-day experience does prove something. There is no doubt in their minds that large class size means shushing, lining up and standing, waiting, hurrying, herding, offering fewer choices, less warmth, less help. . . . Teachers give years of their lives to become professionals. Plus hours for further study—through reading, workshops, institutes—to keep up-to-date. And then they find themselves confronted by crowds.

In a 1969 poll reported in "Should a School Have Fewer Specialists?" a majority of the teachers questioned preferred smaller classes, even if reducing class size meant giving up specialists. The main reasons for wanting smaller classes were "the desire to give children more individual attention and the possibility of fewer discipline problems."

CLASS SIZE AND ECONOMICS

The economic effects of reducing or increasing class size are fairly obvious. A major argument against decreasing class size is the drastic increase in costs resulting from such a reduction. School systems that are hard-pressed to make financial ends meet are rarely receptive to suggestions that the average class size in their district be reduced, since such a reduction would mean a major increase in expenditure.

Size and Cost Increase Together

In a 1967 report, Furno and Collins indicated that the number of classrooms in the country could vary from 66,000 to 272,000, depending solely on variations in class size. Figuring that the average cost of a classroom is $50,000, if a 10,000-pupil district with an average class size of 30 pupils and an average teacher salary of $8,000 were to decrease its average class size to 25, then the additional cost would be more than half a million dollars.

Varner presents a similar hypothetical case in which expenditures increase dramatically with a reduction of only one pupil (from 30 to 29 pupils) per class. Earthman points out that 100 classrooms can serve 2,500 students or 3,500 students, depending on whether the class size is 25 or 35.

Lindbloom notes that increases in expenditure for additional classrooms and teachers would not be the only consequence of decreasing class size. He states that "consideration must be given to additional administrative, custodial, secretarial, and other support personnel so frequently allied with an increase in the number of classroom teachers." He also notes that additional expenditures for more classroom equipment and materials, as well as inservice training for the added teachers, would be necessary.

Templeton concludes that even though the research is inconclusive as to the educational benefits of reducing class

size, "a review of the literature reveals uniformity of opinion on the cost of reducing class size: it is expensive."

The relationship between the educational factors affected by class size and the economic effects of increasing or decreasing class size is often difficult to define, according to Vincent. However, he points out that educational quality and finances are closely related, even though that relationship may not be readily evident. As he states,

> Thus the relation between class size and quality, which might appear at first to be confused or inconclusive, is a factor intimately bound up with fiscal policy. One cannot, it would seem, draw conclusions regarding the influence of class size policy without knowing something about fiscal policy. When this is done, sharp relationships stand out . . .

Thus, the relationship between the educational and economic effects of class size, like so many issues in education, is a close one. And the decision-maker should be aware that changes in class size policy affect both educational quality and finances simultaneously.

Effect on Collective Bargaining

Another economic aspect of class size centers around teacher salaries and collective bargaining. Since one of the determinants of salary is the number of students for whom a teacher is responsible, or collectively, the average number of pupils per teacher within a district, an increase in class size can mean a corresponding increase in salaries. Bargaining organizations can use increases in class size as one basis for requesting that teachers be paid more.

Hall and Carroll substantiate the relationship between class size and salary negotiations by noting that "teachers' organizations are associated with a larger student-teacher ratio." On the basis of their data, they hypothesize that school boards bribe (figuratively speaking) teachers to accept more pupils in their classes by offering them increases in salary. As Hall and Carroll state, "school boards are offering teachers higher salaries in exchange for larger classes and . . . these offers are being accepted. Certainly, there is nothing to suggest

that teachers' organizations have had any success in reducing the number of pupils per classroom." These researchers also point out that, on the average, the salary increases for larger classes are not commensurate with the increases in class size.

> If teachers' associations are accepting larger classes for higher pay, the results of the estimates suggest some interesting conclusions concerning the terms of the "trade-off." Generally our findings indicate that teachers' salaries are being increased by no more than $200.00, while the student-teacher ratio is being increased by about one. With a mean salary of $9,133.00 and an average of 21.3 students per teacher, average salary costs per pupil would appear to be approximately $430.00. It is doubtful whether the differences can be explained by gains in fringe benefits which are not reflected in salary data.

There is a slight irony in this situation described by Hall and Carroll. While teachers experience more nervous strain and feel that they cannot adequately fill their functions as educators in large classes, they seem nonetheless willing to accept less money (per pupil) with an increase in class size.

CONCLUSION

What may the decision-maker conclude from the research on class size? First of all, the inescapable conclusion is that decreases (especially drastic decreases) in class size are expensive. On this point, the experts agree. Second, researchers generally agree that, on the whole, teachers prefer small classes to large ones because they experience less strain and believe that they can more fully realize their teaching potentials in the small-class environment. It is, of course, important for the administrator to take teacher preference into account. Without teacher support, few classroom policies can be successfully implemented.

But beyond the issues of cost and teacher preference, the research on class size offers little in the way of substantive evidence or substantiated generalizations. In the area of achievement as it relates to class size, the research is especially inconclusive. Although the research dealing with educational processes generally favors small classes as being more conducive to the development of a variety of learning activities, more research is needed in this area.

The same conclusion holds true for research dealing with the effects of class size on pupil morale, study habits, and social adjustment.

The lack of conclusive evidence in these very important areas makes the task of the decision-maker that much harder. He must set class-size policy without being able to predict many of the effects his policy will have. For this reason Shapson suggests that such policy should be flexible enough to accommodate a variety of classroom situations: "The research suggests that rather than one rigid class size policy, a flexible approach should be adopted. Class size could be appropriately altered to fit certain situations."

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